Westbrook Power LLC	**)**	**Departmental**
Cumberland County	**)**	**Findings of Fact and Order**
Westbrook, Maine	**)**	**Air Emission License**
A-743-71-A-N	**)**	

After review of the air emissions license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Westbrook Power LLC of Westbrook, Maine has applied for a new Air Emission License for a major new source. The license is for the operation of emission sources associated with their combined cycle electrical generating facility.

Westbrook Power will be a nominally rated 528 megawatt (MW) combined cycle electrical generating facility located in the Five Star Industrial Park. The proposed generating plant will be comprised of two GE Frame 7FA combustion gas turbine generators with two unfired heat recovery steam generators (HRSG) and a condensing steam turbine generator. Each of these units will fire natural gas only.

Westbrook Power also proposes to operate various ancillary fuel burning equipment. These include a smaller auxiliary package boiler firing natural gas, an emergency generator firing low sulfur distillate fuel for emergency back-up electricity for facility lighting and a diesel fire pump rated at 0.216 gallons per minute firing low sulfur distillate fuel with restricted hours of operation. This equipment will be included in Westbrook Power's Air Emission License.

B. Emission Equipment

Westbrook Power is proposing to operate the following air emission units:

Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Fuel Type, %Sulfur	Maximum Firing Rate	Control Device	Stack #
Turbine #1	1,762* (LHV)	Natural Gas	1.934 MMscf/hour	DLN** and SCR***	#1
Turbine #2	1,762* (LHV)	Natural Gas	1.934 MMscf/hour		#2

* based on –20°F ambient temperature, base load, fuel HHV to LHV ratio of 1.109, and higher heating value of 1,000 Btu/scf;
** DLN = Dry Low NO_x combustion system;
*** SCR = Selective Catalytic Reduction

Additional Fuel Burning Equipment

Equipment	Maximum Design Capacity (MMBtu/hr)*	Fuel Type, % Sulfur	Maximum Firing Rate	Control Device	Stack #
Boiler #1 (Auxiliary Boiler)	25	Natural Gas	25,100 scf/hour	LNB**, FGR***	#3
Diesel Unit #1 (Emergency Diesel)	5.4	Diesel, 0.05%	39.3 gal/hour	-	#4
Diesel Unit #2 (Fire Pump)	1.8	Diesel, 0.05%	12.96 gal/hour	-	#5

* estimated
** LNB = Low NO_x Burners
*** FGR = Flue Gas Recirculation

C. Application Classification

A new source is considered a major source based on whether or not expected emissions exceed the "Significant Emission Levels" as given in Maine's Air Regulations. The emissions for new sources are determined by the maximum future license allowed emissions, as follows:

Pollutant	**Max. Future License (TPY)**	**Sig.Level (TPY)**
PM	205.4	100
PM_{10}	205.4	100
SO_2	87.8	100
NO_X	157.4	100
CO	432.7	100
VOC	24.9	50

This source is major for all criteria pollutants with the exception of SO_2 and VOCs. All criteria pollutant emissions associated with this new source are subject to Prevention of Significant Deterioration (PSD) review. A Best Available Control Technology (BACT) analysis is required for PM, SO_2, CO and VOC and a Lowest Achievable Emission Rate (LAER) analysis for NO_x emissions.

D. Offset Requirements

Westbrook Power is to be located in Cumberland County which is a non-attainment region for ozone. Since the proposed NO_x emissions are above the significance levels Westbrook Power will be required to demonstrate that the emissions are meeting the requirements of Lowest Achievable Emission Rates (LAER) as well as obtain emission reduction credits for NO_x.

Obtaining offsets consists of finding existing emission reductions that are federally enforceable prior to the time the new source license is issued and these reductions must be made real before the new source commences operation. The offset ratio for a moderate non-attainment area for Cumberland County requires that the source secure offsets in the ratio of 1.15 to 1. Westbrook Power is acquiring 240 tons of NO_x emission reduction credits to offset the proposed annual NO_x emissions of 157.4 tons/year. The emission reduction credits to be used are from Ogden Energy Group, Inc. for a federally enforceable shutdown in Lawerence Massachusetts. For these emission reduction credits, Westbrook Power has submitted a bill of sale and a copy of the application from Ogden Energy to the Massachusetts DEP to certify these credits.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent best practical treatment (BPT), as defined in Chapter 100 of the Air Regulations. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas. Descriptions of the applicable requirements are provided below under the appropriate headings.

Westbrook Power is proposing the operation of a combined cycle electrical generating facility. The facility will include the following equipment:

- (2) GE Frame 7FA combustion gas turbine generators
- (2) Heat Recovery Steam Generators (HRSG)
- (1) condensing steam turbine generator
- (1) package boiler
- (1) emergency diesel generator
- (1) diesel fire pump

Each of the two combined cycle systems will be comprised of the combustion turbine and an HRSG. The HRSG is specifically designed to match the operating characteristics of the GE gas turbine to provide the optimum performance for the total power cycle. The SCR system is located within the HRSG.

The process starts with combustion air entering through the inlet end of the turbine where it is compressed and mixed with the incoming fuel. The combination is burned in the combustion section of the turbine which incorporates the Dry Low NO_x system to minimize NO_x emissions and create a high pressure, hot gas. This gas is then expanded through the power turbine section where most of its thermal energy is converted to work as it rotates the turbine, producing electricity.

The exhaust is then directed to the HRSG where it is passed over tubes to create a high pressure steam. This high pressure steam is then routed to the steam turbine, increasing the power output of the generator. Within the HRSG, the exhaust gases pass through the SCR system to control NO_x emissions.

The combined cycle units will fire only natural gas thus minimizing the emission of criteria pollutants.

B. BACT and LAER for Combustion Turbines

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT) as defined in Chapter

100 of the Air Regulations. BACT is a top down approach to selecting air emission controls considering economic, environmental and energy impacts. Westbrook Power is also subject to Lowest Achievable Emission Rates (LAER) for NO_x due to its location in a non-attainment area.

The proposed plant will consist of two GE Frame 7FA combustion gas turbine generators, two triple pressure unfired, natural circulation heat recovery steam generators, and one tandem compound, reheat, double flow condensing steam turbine generator. The two turbine generators will vent to two separate 165 foot tall exhaust stacks. BACT for PM, PM_{10}, SO_2, CO and VOC is proposed as follows:

1. *PM and PM_{10}*
   Particulate matter emissions are formed from non-combustible ash and metals in the fuel, and trace inorganic matter drawn in by the inlet turbine air. Natural gas contains very low ash and metal content. However, as will be stated in a following section, secondary reactions caused by the introduction of ammonia (used to control NO_x emissions) will generate fine particulate matter in the form of ammonium salts, thus increasing the amount of particulate slightly. Add-on controls would not provide any appreciable control due to the low particulate matter concentration in the turbine exhaust. Westbrook Power will utilize turbines equipped with DLN combustors that will help minimize the particulate matter emissions and will also practice good combustion practices and utilize clean fuels to achieve an emission rate more stringent than 0.06 lb/MMBtu per Chapter 103. With the above operations being met, Westbrook Power will meet the requirements of BACT for particulate matter.

2. *SO_2*
   Sulfur dioxide is formed in the turbine from the oxidation of sulfur in the fuel. Westbrook Power's natural gas supply is not expected to exceed a sulfur content of 2.0 grains per 100 standard cubic feet. The low sulfur content in the fuel will therefore render flue gas desulfurization systems ineffective for use on these turbines. Restrictions on the fuel sulfur content represent the only practical control for limiting SO_2. Therefore, BACT for SO_2 will be the firing of natural gas.

3. *CO*
   Carbon monoxide forms in turbines from incomplete combustion of fuel. Adequate fuel residence time and high temperature in the combustion zone can ensure minimal CO formation. However, the increase in temperature causes an exponential increase in NO_x formation. Water or steam

injection and DLN combustors function to lower the combustion zone temperature and thereby reduce NO_x, thus achieving a balance between NO_x and CO formation.

CO combustion control performance is a function of available oxygen, combustion temperature, turbulence, residence time and the fuel in the combustion zone. The one add-on control investigated in this application that has been employed in turbine applications is the oxidation catalyst. The catalyst lowers the activation energy necessary for CO to react with available oxygen to produce CO_2. The oxidation catalyst operates optimally between 700 to 1100^oF. Consequently, CO control efficiency is reduced during operation at lower temperatures such as start-up, shutdown and low partial loading.

An oxidation catalyst also lowers the activation energy for other reactions such as sulfur in the natural gas becoming oxidized to form SO_3 which then dissolves in moisture in the turbine exhaust to form sulfuric acid mist. The H_2SO_4 then reacts with the ammonia in the SCR control system to form ammonium salts which will build up on the HRSG tubes and fins causing increased pressure drop, decreasing turbine performance, increasing maintenance and reducing equipment life. Thus a CO oxidation catalyst provides a trade-off between CO reductions and sulfuric acid and particulate matter emissions.

An economic impact analysis was performed to identify the average cost effectiveness of operating an oxidation catalyst to reduce CO emissions to 3 ppm. The average cost effectiveness was in excess of $3000 per ton of CO removed, therefore not supporting the use of the catalyst as BACT for Westbrook Power's application. Also, based on ambient air modeling performed for this project, Westbrook Power's maximum impacts are less than the standards. Energy losses were also considered and were found to be in excess of 1,000,000 kW-hours per year. Therefore, based on energy, economic and environmental impacts, the oxidation catalyst is not supported as BACT.

As will be discussed in subsequent sections, Westbrook Power is proposing the installation of DLN combustors to reduce NO_x emissions. The DLN system can achieve very low CO emissions over the 50% to 100% load range without add-on controls. Therefore, Westbrook Power can achieve a CO performance level that is comparable to that proposed as BACT for other similar projects within the state. Thus, the Department

finds that the next most effective CO control option, a DLN combustor that achieves 15 ppm, meets BACT for CO.

4. *VOC*
   VOCs form in the turbine from incomplete combustion of the fuel. Adequate fuel residence time and high temperature can ensure minimal VOC formation. With the development of the DLN system, manufacturers have combined the benefits of fuel/air pre-mixing and lean burn staged combustion to obtain both efficient combustion, resulting in low CO and VOC with a reduced flame temperature to ensure minimal formation of NO_x. The Department concludes that the use of DLN combustors limiting VOC emissions to 3 pounds per hour will meet the requirements of BACT for VOC.

5. *NO_x*
   Sources of nitrogen in the combustion process include atmospheric nitrogen and fuel bound nitrogen, commonly referred to as "thermal" and "fuel" NO_x respectively. Due to the negligible amounts of nitrogen found in natural gas, emphasis on controlling NO_x emissions from combustion turbines has been placed on reducing the formation of thermal NO_x.

   When firing natural gas, reduction in the formation of thermal NO_x is achieved with DLN combustor technology. DLN combustors have become standard for new turbines due to the substantial reduction in thermal NO_x over conventional turbines.

   There are currently two add-on control technologies available and in use for combustion turbines: selective catalytic reduction (SCR) and SCONOx, a new technology.

   a. SCR
      In an SCR system, ammonia is injected into the turbine exhaust to react with nitrogen oxides in the presence of a catalyst to form nitrogen and water. The reactions occur in micropores on the surface of the catalyst. For optimum operation the catalyst temperature must remain within a given range of approximately 600 to 750^{o}F for vanadium/titanium catalysts. Operation above the temperature range can cause oxidation of ammonia and thereby increase NO_x emissions.

Operation below the temperature range reduces the rate of reaction, increasing uncontrolled NO_x emissions and unreacted ammonia emissions (ammonia slip). In combined cycle units the SCR is placed between specific tube sections in the HRSG, where, during normal steady state operation, the catalyst remains within the established temperature range. During start-up and shutdown periods ammonia feed is automatically switched off until acceptable temperatures exist.

SCR offers the highest available NO_x control for combustion turbines and has been the most commonly selected technology for turbines to meet the requirements of LAER. Natural gas fired turbines equipped with DLN combustors in conjunction with SCR have achieved NO_x emissions in the range of 4.5 to 6.0 ppm, with the lowest values specified for major sources locating in a non-attainment area, such as Westbrook Power.

b. SCONOx

SCONOx is a new add-on control technology demonstrating significant NO_x reduction capability. The SCONOx system oxidizes both NO and CO to form NO_2 and CO_2 and subsequently absorb the NO_2 using a potassium carbonate catalytic absorber. The absorber must be periodically taken off line to be regenerated. Since the system does not use ammonia to reduce NO_x, it offers add-on control without ammonia emissions.

Although the results to date look encouraging, SCONOx is still an emerging technology which will require further evaluation to document long term performance and reliability of the catalyst and catalyst regeneration system's numerous mechanical parts before receiving wide commercial acceptance with smaller turbines, as well as the larger ones. Therefore, at this time this technology does not represent a practicable control technology for application to this project.

Other control technologies are currently being developed, however, as defined by LAER, it is to be the most stringent emission limitation which is achieved in practice. Therefore, to meet the requirements of LAER for NO_x at Westbrook Power, DLN combustors and SCR will be utilized.

6. *Ammonia*

When high NO_x removal efficiency is specified with SCR, the molar ratio of ammonia injected to NO_x in the flue gas must exceed the stoichiometric ratio needed to fully react with all of the ammonia, commonly referred to

as ammonia slip. Actual ammonia slip levels for a new unit are relatively low. However, as the system ages and physical and chemical poisoning occur, the SCR catalyst is gradually deactivated corresponding to an increase in ammonia injection. This causes a corresponding gradual increase in ammonia slip.

Operation of the turbines without SCR would not meet the control levels currently regarded as LAER for the control of NO_x. Therefore, due to the lack of acceptable options for reducing ammonia emissions projects must identify an ammonia slip level that balances the need to minimize ammonia emissions with the need to obtain adequate useful life of the catalyst while reducing NO_x emissions. Westbrook Power proposes 10 ppm (30 day rolling average) and 20 ppm (24 hour block average) as the level of control for ammonia slip.

7. *Opacity*
Visible emissions from each turbine shall not exceed 20% opacity, measured on a six (6) minute average, except for one (1) six (6) minute block average not to exceed 27% opacity in any one hour period.

LAER and BACT Summary for the Combustion Turbines

Pollutant	**Control Level**	**Emission Level**	**Control Device(s)**
PM/PM_{10}	BACT	22 lb/hour	Clean Fuel
SO_2	BACT	12 lb/hour	Natural Gas
CO	BACT	15 ppm	DLN Combustors
VOC	BACT	3 lb/hour	DLN Combustors
NO_x	LAER	2.5 ppm*	DLN Combustors and SCR
ammonia	-	10 ppm**	-

*: based on a 3-hour block average
**: based on a 30 day rolling average

C. New Source Performance Standards (NSPS)

The two turbines are each subject to NSPS 40 CFR part 60 Subpart GG - Standards of Performance for Stationary Gas Turbines, for which construction is commenced after October 3, 1977.

NSPS establishes the following emission limits:

SO_2: (1) 0.015% by volume @ 15% O_2 on a dry basis, or
(2) the fuel sulfur content shall not exceed 0.8% by weight

NO_x: (1) NO_x is limited based on the following equation:

STD=0.0075 * (14.4/Y) + F; where

STD is the allowable NO_x emissions (ppm by volume at 15% O_2 on a dry basis)
Y is a function of the manufacturers rated load (kilojoules per watt hour), and
F is a function of the fuel bound nitrogen.

NSPS also establishes a NO_x emission limit of 75 ppmdv at 100% load and ISO conditions. By meeting the more stringent LAER emission limit, Westbrook Power will be in compliance with NSPS.

Additionally, NSPS requires that Westbrook Power monitor the fuel bound nitrogen and sulfur content of the fuel for every bulk storage shipment or daily if there is no bulk storage, with the option to petition the Administrator for an alternative schedule.

D. Ancillary Equipment

1. Package Boiler
   Westbrook Power will utilize a small natural gas fired package boiler for assistance with turbine start-up. By firing natural gas, emissions will be minimal from this unit. However, since the facility is locating in a non-attainment area, NO_x emissions are subject to LAER. Post combustion controls such as SCR and SNCR (selective non-catalytic reduction) have not been used in practice on small package boilers because of the compact design configuration of the heat exchange tubes and the relatively small quantity of NO_x emissions they generate.

   After reviewing the control technologies used in practice through the RACT-BACT-LAER Clearinghouse, Westbrook Power found that small industrial boilers limit NO_x to levels as low as 0.035 lb/MMBtu (approximately 30 ppm). Therefore, Westbrook Power will select a boiler and combustion controls that will control NO_x formation at or below this level to meet LAER.

2. Emergency Diesel Generator
   Westbrook Power also proposes to install an emergency diesel generator set to provide back-up electricity for facility lighting. The engine will be rated at approximately 500 kW and will burn transportation grade distillate oil with a

sulfur content not to exceed 0.05% by weight. Hours of operation will be restricted to no more than 500 hours per year with anticipated actual operation being much lower.

Add-on controls have not been used in practice due to the limited operation and added complications in maintenance, as with combustion controls such as timing retard which adversely affect engine start up reliability. Westbrook Power concludes that engine operation with the low sulfur fuel and restricted hours of operation meet LAER for NO_x and BACT for all other regulated pollutants.

3. Fire Pump Generator

The facility will also be equipped with a diesel fire pump. The engine will burn transportation grade distillate oil having a sulfur content not to exceed 0.05% by weight. The hours of operation will be restricted to 500 hours per year, although actual operation is anticipated to be much lower.

For the same reasons stated above for the emergency diesel, add-on controls and combustion controls are not warranted. Therefore, Westbrook Power concludes that limited fire pump operation firing low sulfur fuel will meet the requirements of LAER for NO_x and BACT for all other regulated pollutants.

4. Cooling Tower

Westbrook Power is proposing to use wet mechanical cooling towers to transfer waste heat from cooling water to atmosphere. Cooling water will be used to cool and condense steam exiting the steam turbine and to cool the wet surface air cooler (WSAC) condensers used in cooling inlet air.

The cooling tower functions by spraying cool water over a column of packing while a fan draws air up through the packing to promote evaporative cooling. In the process water mist droplets can become entrained in the circulating air and get discharged to the atmosphere. The water “drift” is a source of particulate matter emissions as the water evaporates and the dissolved salts in the water solidify. This drift will be minimized by the installation of mist eliminators within the tower to capture the mist and droplets. The proposed water source is Portland Water District which has been found to have a low salt content. Cooling towers equipped with mist eliminators utilizing Portland Water District as a water source will meet the requirements of BACT.

E. Additional Facility Requirements

1. Title V Operating Permit Program
Westbrook Power will be subject to the Federal Title V Operating Permit Program. As a major source the facility will be required to obtain a Title V Permit pursuant to Chapter 140 of the Maine Air Regulations. Within 12 months of initial start up, Westbrook Power must file a complete application with the Department for an initial Part 70 License.

2. Acid Rain Program
Title IV of the CAA of 1990 is a program to control SO_2 and NO_x emissions that contribute to the formation of acid precipitation. Westbrook Power will be classified as a Phase II 'new affected unit', effective January 1, 2000, or within 90 days after commencement of commercial operation, whichever is later.

Per Title IV, Westbrook Power shall:
- acquire SO_2 allowances in the amount of one allowance for each ton of SO_2 emitted;
- install continuous emission monitoring systems (CEMS) that meet the specifications of 40 CFR Part 75;
- name a designated representative to be responsible for submitting compliance monitoring reports and for obtaining necessary allowances on behalf of the facility; and
- submit an acid rain license application to the Department.

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview
A combination of screening and refined modeling was performed to show that the proposed Westbrook Power LLC (WPLLC) facility emissions, in conjunction with other sources, would not cause or contribute to violations of Maine Ambient Air Quality Standards (MAAQS) for SO_2, PM_{10}, NO_2, and CO, or to Class I or Class II increments for SO_2, PM_{10} and NO_2. In addition, analyses were performed to show that WPLLC's emissions will not adversely impact other Class I and II air quality related values (AQRVs).

B. Model Inputs
SCREEN3 screening and ISCST3 (simple terrain mode) refined models were used to address standards and increments in all areas. In addition, the SCREEN3 model

was used to evaluate impacts in intermediate and complex terrain, i.e., areas where terrain elevations exceed the proposed stack-top elevations.

All modeling was performed in accordance with all applicable requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA).

A valid 5-year hourly meteorological off-site database was used in the ISCST3 refined modeling. The primary wind data was collected at a height of 10 meters at the Portland National Weather Service (PNWS) site located at the Portland International Jetport during the 5-year period 1986-1990. All five years of meteorological data contained no missing data. Hourly cloud cover, ceiling height and surface wind speed data, also from the PNWS were used to calculate stability. Hourly mixing heights were derived from PNWS surface and upper air data.

Stack parameters for WPLLC are listed in Table IV-1. The proposed stacks at WPLLC are less than their respective formula GEP heights, therefore WPLLC's proposed stacks were modeled with the appropriate downwash algorithms as required. Since WPLLC's proposed stacks are greater than H + 0.5L (where H is the height of the controlling structure and L is the lesser of the height or maximum projected width of that structure), no cavity analysis was performed.

Table IV-1 WPLLC Proposed Stack Parameters

Facility/Stack	Stack Base Elev. (m)	Stack Height (m)	GEP Stack Height (m)	Stack Dia. (m)	UTM E (km)	UTM N (km)
Turbine Stack 1	30.48	50.29	80.01	5.49	388.910	4834.520
Turbine Stack 2	30.48	50.29	80.01	5.49	388.920	4834.480

Emission parameters for WPLLC's two gas turbines for MAAQS and increment modeling are listed in Table IV-2. The emission parameters for the gas turbines are based on the maximum license allowed (base) typical (75%) and minimum (50%) load operating configurations at ambient temperatures of 15°F, 45°F and 90°F. The gas turbines will only fire natural gas. For the purpose of determining NO_2 and PM_{10} impacts, all NO_x and PM emissions were conservatively assumed to convert to NO_2 and PM_{10}, respectively.

Table IV-2 WPLLC's Proposed Emission Parameters

Operating Scenario/ Facility/Stack	SO_2 (g/s)	PM_{10} (g/s)	NO_2 (g/s)	CO (g/s)	NH_3 (g/s)	Temp (°K)	Stack Vel. (m/s)
Base Load 15°F							
Turbine Stack 1	1.47	2.78	3.15	6.68	nm	351	21.02

Turbine Stack 2	1.47	2.78	3.15	6.68	nm	351	21.02
Base Load 45°F							
Turbine Stack 1	1.35	2.78	2.90	6.17	nm	350	19.52
Turbine Stack 2	1.35	2.78	2.90	6.17	nm	350	19.52
Base Load 90°F							
Turbine Stack 1	1.21	2.78	2.65	5.54	nm	355	18.09
Turbine Stack 2	1.21	2.78	2.65	5.54	nm	355	18.09
75% 15°F							
Turbine Stack 1	1.21	2.78	2.52	5.29	nm	346	16.49
Turbine Stack 2	1.21	2.78	2.52	5.29	nm	346	16.49
75% 45°F							
Turbine Stack 1	1.08	2.78	2.39	5.04	nm	342	15.49
Turbine Stack 2	1.08	2.78	2.39	5.04	nm	342	15.49
75% 90°F							
Turbine Stack 1	1.07	2.78	2.14	4.66	nm	348	14.69
Turbine Stack 2	1.07	2.78	2.14	4.66	nm	348	14.69
50% 15°F							
Turbine Stack 1	0.95	2.52	2.02	4.41	nm	339	13.21
Turbine Stack 2	0.95	2.52	2.02	4.41	nm	339	13.21
50% 45°F							
Turbine Stack 1	0.95	2.52	1.89	4.16	2.90	334	12.50
Turbine Stack 2	0.95	2.52	1.89	4.16	2.90	334	12.50
50% 90°F							
Turbine Stack 1	0.81	2.52	1.76	3.91	nm	343	12.12
Turbine Stack 2	0.81	2.52	1.76	3.91	nm	343	12.12

Note: nm = not modeled

C. Applicant's modeled impacts.

Simple terrain SCREEN3 modeling was performed for the nine (9) WPLLC operating scenarios listed in Table IV-2. Results in Table IV-3 show impacts that are slightly over Class II significance levels for all but the 3-hour SO_2, the 1-hour CO and the 8-hour CO averaging periods.

Table IV-3. Maximum SCREEN3 Simple Terrain Impacts from WPLLC Turbines.

Pollutant/	Max	Maximum Impact Receptor Location	de minimus	Class II Sig.	Class II

Averaging Period	Impact (µg/m³)	Distance (km)	Dir.	Elev. (m)	Level (µg/m³)	Level (µg/m³)	Increment (µg/m³)
SO_2 3-hour	17.08*	0.096	SW	32.00	**n/a**	**25**	**512**
SO_2 24-hour	**7.59***	0.096	SW	32.00	**13**	**5**	**91**
SO_2 Annual	**1.52***	0.096	SW	32.00	**n/a**	**1**	**20**
PM_{10} 24-hour	**20.24***	0.096	SW	32.00	**10**	**5**	**30**
PM_{10} Annual	**4.04***	0.096	SW	32.00	**n/a**	**1**	**17**
NO_2 Annual	**3.17@**	0.096	SW	32.00	**14**	**1**	**25**
CO 1-hour	83.53#	0.096	SW	32.00	**n/a**	**2,000**	**n/a**
CO 8-hour	58.47#	0.096	SW	32.00	**575**	**500**	**n/a**

Notes:
n/a = not applicable
* = 50% 45°F operating scenario
@ = 75% 45°F operating scenario
# = 50% -20°F operating scenario

Sequential ISCST3 (simple terrain mode) modeling using all five years (1986-1990) of meteorological data was then performed for the nine (9) WPLLC operating scenarios listed in Table IV-2. Results in Table IV-4 show impacts for all SO_2, PM_{10}, NO_2 and CO averaging periods are insignificant and below de minimus levels in simple terrain. Therefore, combined source MAAQS and increment modeling analyses are not required in simple terrain Class II areas.

Table IV-4. Maximum ISCST3 (Simple Terrain Mode) Impacts from WPLLC Turbines.

Pollutant/ Averaging Period	Max Impact (µg/m³)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	de minimus Level (µg/m³)	Class II Sig. Level (µg/m³)	Class II Increment (µg/m³)
SO_2 3-hour	6.41*	388.800	4834.800	30.48	**n/a**	**25**	**512**
SO_2 24-hour	1.82*	389.000	4834.400	32.00	**13**	**5**	**91**
SO_2 Annual	0.15*	389.000	4834.400	32.00	**n/a**	**1**	**20**
PM_{10} 24-hour	4.84#	389.000	4834.400	32.00	**10**	**5**	**30**
PM_{10} Annual	0.40*	389.000	4834.400	32.00	**n/a**	**1**	**17**
NO_2 Annual	0.29*	389.000	4834.400	32.00	**14**	**1**	**25**
CO 1-hour	38.07*	388.800	4834.800	30.48	**n/a**	**2,000**	**n/a**
CO 8-hour	18.99*	389.000	4834.400	32.00	**575**	**500**	**n/a**

Notes:
n/a = not applicable
* = 50% 45°F operating scenario
# = 50% 90°F operating scenario

Finally, intermediate/complex terrain SCREEN3 modeling was performed for the nine (9) WPLLC operating scenarios listed in Table IV-2. Results in Table IV-5 show impacts for all SO_2, PM_{10}, NO_2 and CO averaging periods are insignificant and below de minimus levels in intermediate/complex terrain. Therefore, combined source MAAQS and increment modeling analyses are not required for any pollutant/terrain combinations in Class II areas.

Table IV-5. Maximum SCREEN-3 Intermediate/Complex Terrain Impacts from WPLLC Turbines.

Pollutant/ Averaging Period	S3V Max Impact (µg/m³)	S3S Max Impact (µg/m³)	Maximum Impact Receptor Location			de minimus Level (µg/m³)	Class II Sig. Level (µg/m³)	Class II Increment (µg/m³)
			Distance (km)	Dir.	Elev. (m)			
SO_2 3-hour	2.42#	4.09*	6.457	WNW	99.36	**n/a**	**25**	**512**
SO_2 24-hour	0.67#	1.82*	6.457	WNW	99.36	**13**	**5**	**91**
SO_2 Annual	0.21#	0.36*	6.457	WNW	99.36	**n/a**	**1**	**20**
PM_{10} 24-hour	1.64*	2.43*	6.457	WNW	99.36	**10**	**5**	**30**
PM_{10} Annual	0.52*	0.49*	6.457	WNW	99.36	**n/a**	**1**	**17**
NO_2 Annual	0.46#	0.73*	6.457	WNW	99.36	**14**	**1**	**25**
CO 1-hour	12.16#	20.02*	6.457	WNW	99.36	**n/a**	**2,000**	**n/a**
CO 8-hour	8.52#	14.01*	6.457	WNW	99.36	**575**	**500**	**n/a**

Notes:
S3V= Valley subroutine of the SCREEN3 Model
S3S = Simple terrain subroutine of the SCREEN3 Model
n/a = not applicable
* = 50% 45°F operating scenario
# = Base -20°F operating scenario

D. Additional Impact Analyses

Federal guidance and Chapters 115 and 140 of the MEDEP regulations require that any new major source provide additional analyses of impacts that would occur as a direct result of the general, commercial, residential, industrial and other growth associated with the construction and operation of that source. In addition, an analysis of impairment to visibility, soils and vegetation that would occur as a result of any new major source is required.

GENERAL GROWTH: Some increases in local emissions due to construction related activities (mobile sources, excavating, grading, welding, painting, etc.) are expected to occur for approximately 24 months. The emissions produced by these

activities will be localized. Emissions of dust will be minimized by the use of "Best Management Practices" for suppression of fugitive particulate matter during construction and operation. Increases in potential emissions of NO_x due to commuting by construction workers will be temporary, spread out over a wide area and short-lived. Due to the lack of substantial general growth, no further ambient impact analysis is required.

RESIDENTIAL GROWTH: Population growth in the impact area of the proposed source can be used as a surrogate factor for the growth in emissions from residential combustion sources. Construction of the facility is expected to create approximately 27 new full-time jobs. As a result of the minimal manpower requirements, operations and support required for the facility will, for the most part, be available from the region. It is expected that no new significant residential growth will follow from this source.

COMMERCIAL, INDUSTRIAL and OTHER GROWTH: The proposed project will be constructed for the sale of electricity only. Since the proposed project will consume very little in terms of raw materials and supplies, construction of new industries and businesses to support the facility's operation will likely not be needed, therefore, no significant commercial, industrial or other growth is expected to occur as a result of this project.

CLASS II VISIBILITY: Visible emissions from the proposed facility will be minimized by controlling emissions through the implementation of LAER/BACT.

SOILS AND VEGETATION: Impacts on sensitive vegetation and soils were evaluated using the maximum impacts from the ISCST3 and SCREEN3 modeling. The results of the soil and vegetation impacts are shown in Table IV-6. Evaluation of SO_2, NO_2 and CO impacts on sensitive vegetation and soils was performed by comparison of predicted facility impacts with screening levels presented in *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils and Animals* (EPA, December, 1980, EPA 450/2-81-078). Evaluation of ammonia (NH_3) impacts on sensitive vegetation and soils was performed by comparison of predicted facility impacts with injury threshold levels presented in *Fundamentals of Air Pollution* (Second Edition, 1984 by A.C. Stern, R.W. Boubel, D.B. Turner and D.L. Fox). Any acute or chronic deleterious effects to the soils and vegetation would be expected to occur only at ambient concentration levels substantially higher than impacts predicted by dispersion modeling. Proposed emissions from WPLLC are not expected to impact even the more sensitive soils or vegetation near the facility. Because the soil and vegetation impacts near the facility (non-

Class I) are well below sensitivity levels, impacts in Class I areas were not evaluated.

TABLE IV-6. Soil and Vegetation Impacts, WPLLC Alone

Pollutant	Averaging Period	Max WPLLC Class II Impact (μg/m³)	Sensitivity Screening Levels (μg/m³)
SO_2	1-hour	10.07[1]	917
	3-hour	7.55[1]	786
	Annual	0.21[2]	18
NO_2	4-hour	13.04[1]	3,760
	8-hour	9.84[1]	3,760
	1-Month	0.79[1]	564
	Annual	0.46[2]	94
CO	1-Week	<18.99[3]	1,800,000
NH_3	4-hour	20.01[4]	14,000[5]

Notes:
[1] = highest ISCST3 modeled impact.
[2] = ratioed from the highest 1-hour SCREEN3 (Valley Subroutine) modeled impact.
[3] = highest 8-hour ISCST3 modeled impact.
[4] = highest ISCST3 modeled impact 50% load @45°F, 20 ppm NH_3 slip.
[5] = injury threshold (Stern et al)

E. Class I Impacts

Since the proposed emissions from WPLLC are entirely increment consuming and the nearest Class I area (Great Gulf/Presidential Range-Dry River Wilderness (GG/PR)) is approximately 87 kilometers west-northwest of WPLLC, a Class I increment analysis was performed. Sequential ISCST3 (simple and complex terrain mode) modeling, using all five years (1986-1990) of meteorological data, was performed for the nine (9) WPLLC operating scenarios listed in Table IV-2 to assess WPLLC's maximum Class I increment impacts in simple/intermediate/complex terrain of GG/PR.

The maximum increment impacts for WPLLC alone in the GG/PR Class I area were predicted to be insignificant for all pollutants as shown in Tables IV-7. Because all impacts were below all Class I significance levels, no other sources were included in the analysis.

Since maximum predicted impacts in the closest Class I area (GG/PR) meet all Class I increment standards, the other more distant (> 100 kilometers) Class I areas at Acadia National Park, Moosehorn National Wildlife Refuge and Roosevelt Campobello International Park were not evaluated.

Table IV-7. Increment Consumption in the Great Gulf/Presidential Range-Dry River Wilderness Class I Area

Pollutant/ Averaging Period	Max ISCST3 Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class I Significance Level ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)
SO_2 3-hour	0.0947#	317.710	4884.340	329.18	**1.0**	**25**
SO_2 24-hour	0.0174#	317.710	4884.340	329.18	**0.2**	**5**
SO_2 Annual	0.0013#	317.710	4884.340	329.18	**0.08**	**2**
PM_{10} 24-hour	0.0390*	317.710	4884.340	329.18	**0.32**	**10**
PM_{10} Annual	0.0028@	317.710	4884.340	329.18	**0.16**	**5**
NO_2 Annual	0.0029#	317.710	4884.340	329.18	**0.1**	**2.5**

Notes:
= Base -20°F operating scenario
* = Base 90°F operating scenario
@ = 75% 45°F operating scenario

F. Class I AQRV Analyses

The Federal Land Manager for the GG/PR Class I area has identified scenic beauty, vegetation, wildlife, water and odor as AQRVs. The VISCREEN model was used to evaluate the scenic beauty (visibility) AQRV. Evaluation of all other AQRVs used IWAQM Phase I recommendations (using the ISCST3 model as a Level I screening technique) and USDA Forest Service recommended techniques outlined in the following document: *Screening Procedure to Evaluate Effects of Air Pollution on Eastern Region Wilderness Cited as Class I Air Quality Areas* (Adams et al, 1991, Gen. Tech. Rep. NE-151, Radnor, PA; US Dept. of Agriculture, Forest Service, Northeastern Forest Experiments Station)).

CLASS I VISIBILITY (Scenic Beauty): A VISCREEN Level-1 analysis was used to assess visibility impacts on Class I areas inside GG/PR and Integral Vistas outside GG/PR. Table IV-8 summarizes the VISCREEN model input data for the Class I area's Level-1 analysis. Data include source emissions from the facility, distances to the Class I areas, plume-observer angle, background visual range, model default values for meteorological conditions and background air quality levels.

Table IV-8. VISCREEN Input Data

POLLUTANT INPUT DATA			
Pollutant	Maximum Operating Case Emissions (g/s)		
Particulates	5.56		
NO_x (as NO_2)	6.30		
Primary NO_2	0.00		
Soot	0.00		
Primary SO_4	0.00		
DEFAULT PARTICLE CHARACTERISTICS			
Background Ozone	0.10 ppm		
Background Visual Range	60.00 km		
Plume-Source-Observer Angle	11.25°		
DISTANCE INPUT DATA			
	DISTANCE TO CLASS I AREAS		
Class I Area	Source-Observer Distance (km)	Minimum Source-Class I Distance (km)	Maximum Source-Class I Distance (km)
Great Gulf/Presidential Range-Dry River Wilderness	86.92	86.92	100.87

Results of the Level-1 analyses are summarized in Table IV-9. This table presents the worst-case plume perceptibility (Delta-E) and plume contrast values obtained for each situation analyzed. Level-1 screening results indicate that WPLLC's proposed facility will not cause plume visibility impacts within the GG/PR Class I area. Because critical visibility values could be met using this method, no Level-2 visibility analysis or regional haze analysis were performed.

Table IV-9. VISCREEN Model Results in Class I Areas

Level 1 Analysis						
			Inside Class I Area		Integral Vistas	
			Delta E	Contrast (±)	Delta E	Contrast (±)
CRITICAL VALUES			2.0	0.05	2.00	0.05
GREAT GULF/PRESIDENTIAL RANGE-DRY RIVER WILDERNESS AREAS						
Case	Background	Sun Angle	Delta E	Contrast (±)	Delta E	Contrast (±)
Maximum	Sky	10°	0.319	0.004	0.409	0.004
Maximum	Sky	140°	0.074	-0.003	0.073	-0.003
Maximum	Terrain	10°	0.171	0.002	0.219	0.002

Maximum	Terrain	140°	0.033	0.001	0.046	0.002

OTHER AQRVs: Analysis of WPLLC's emissions on vegetation, wildlife, water and odor AQRVs in the GG/PR Class I areas was completed by the applicant's consultant using IWAQM Phase I and USDA Forest Service recommendations. Results in Table IV-6 and Table IV-10 show that sensitive vegetation, soils, wildlife and aquatic resources will not be adversely impacted by WPLLC's SO_2, ozone precursor (NO_2), NH_3 and CO emissions. In addition, no adverse impacts due to odor from WPLLC emissions will occur due to the clean technology and fuel (natural gas) that will be used. Therefore, it is reasonably certain that WPLLC emissions will not significantly contribute to adverse impacts of any Class I AQRV.

Table IV-10. WPLLC Impacts vs. Green-Line Screening Values

Pollutant	Green-Line*	WPLLC ISCST3 Impact
TERRESTRIAL EFFECTS		
SO_2 annual mean	< 5 µg/m³	0.0013 µg/m³
SO_2 3-hour maximum	< 100 µg/m³	0.13 µg/m³
Total Sulfur Deposition	5 to 7 kg/ha/yr	0.0021 kg/ha/yr#
Total Nitrogen Deposition	5 to 8 kg/ha/yr	0.0627 kg/ha/yr#
Ozone	≤ 80 ppb	**
AQUATIC EFFECTS		
Total Sulfur Deposition	5 to 7 kg/ha/yr	0.0021 kg/ha/yr#
Sulfur Deposition + 20% of Nitrogen Deposition	5 to 8 kg/ha/yr	0.0627 kg/ha/yr#

* Level at which it can be reasonably certain that no significant change would be observed in ecosystems containing significant numbers of sensitive components.

** WPLLC will not emit O_3 directly, however WPLLC is required to offset emissions of NO_x (ozone precursor) by a ratio of at least 1.15:1.

\# calculated according to IWAQM Phase I recommendations.

G. Summary

It has been demonstrated that WPLLC's facility in its proposed configuration (NO_x at 3.5 ppm) will not cause or contribute to a violation of any SO_2, PM_{10}, NO_2 or CO averaging period MAAQS. It has also been demonstrated that WPLLC's facility in its proposed configuration will not cause or contribute to a violation of any SO_2, PM_{10}, or NO_2 averaging period Class I or Class II increment standards. In addition, WPLLC's facility, in its proposed configuration will cause no impairment to AQRVs in Class I or II areas.

ORDER

Based on the above Findings and subject to conditions listed below the Department concludes that the emissions from this source:

- will receive Best Available Control Technology (BACT) and Lowest Achievable Emission Rates (LAER),
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-743-71-A-N, subject to the following conditions:

STANDARD CONDITIONS:

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions.

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115.

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both.

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request.

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 MRSA §353.

(6) The license does not convey any property rights of any sort, or any exclusive privilege.

(7) The licensee shall maintain and operate all emission units and air pollution control systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions.

(8) The licensee shall maintain sufficient records, to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request.

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for the renewal of a license or amendment shall not stay any condition of the license.

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license.

(11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:

a. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
    1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
    2. pursuant to any other requirement of this license to perform stack testing.
b. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and
c. submit a written report to the Department within thirty (30) days from date of test completion.

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

a. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and

b. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

c. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

(13) Notwithstanding any provisions of this license or any other provision in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement.

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation.

(15) Upon the written request of the Department, the licensee shall establish and maintain such records, make such reports, install, use, and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status.

SPECIFIC CONDITIONS:

(16) Construction Requirements

A. Westbrook Power's construction of the electrical generation facility shall be consistent with the proposed facility described in the air emissions license application submitted to the Bureau of Air Quality on August 7, 1998.

B. Westbrook Power shall vent each turbine exhaust through separate 165 foot above ground level stacks.

C. Westbrook Power shall install emission test ports in accordance with the criteria of 40 CFR 60, Appendix A, Method 1, and test platforms, if necessary, to allow emission testing for the gas turbine system.

(17) Averaging Periods

The following shall apply to the conditions in this order as appropriate, unless it is otherwise stated for each unit:

A. A 3-hour block average basis shall be calculated as the arithmetic average of not more than three (3) one hour block periods. No more than eight (8) 3-hour block averages shall be calculated for one day. One 3-hour block average shall be calculated for the period from midnight to 3:00am, one from 3:00 am to 6:00 am, one from 6:00 am to 9:00 am, etc.

B. A 24-hour block average basis shall be calculated as the arithmetic average of not more than 24 one (1) hour block periods. Only one 24-hour block average shall be calculated for one day, beginning at midnight.

C. A 30 day rolling average shall be calculated as the arithmetic average of not more than thirty (30) twenty four (24) hour block averages.

(18) Operation Requirements

A. Westbrook Power shall operate selective catalytic reduction (SCR) systems to reduce NO_x emissions from the turbines, except during start-up, shutdown and waterwash.

B. Westbrook Power shall minimize emissions from the gas turbines to the maximum extent practicable during start-up and shutdown, under maintenance or adjustment conditions, during equipment cleaning conditions, and during initial gas turbine commissioning.

C. The following conditions shall apply to start-up and shut down procedures:

1. Turbine start-up shall be defined as that period of time from initiation of combustion turbine firing until the unit reaches steady state load operation. Steady state operation shall be reached when the combustion turbine reaches 50% baseload and the steam turbine is declared available for load changes. Start-up shall be completed as soon as practicable, but in no case shall the period exceed 300 minutes. Westbrook Power shall track and record all start-up times and the rolling average start time of the previous ten starts to demonstrate that a good faith effort has been made to start the turbines in a timely manner. Records on start-ups lasting longer than 240 minutes shall include an explanation of the circumstances that lead to the longer start-up.
2. A turbine shutdown shall be defined as that period of time from steady state operation to cessation of combustion turbine firing. This period shall not exceed 60 minutes.

3. Initial turbine commissioning shall be defined as the period of time from initial turbine start-up to the date of the initial performance test, but not later than 180 days after the initial start-up.
4. Water wash of the combustion turbine shall be defined as that period of time during which water or water solution is injected into the gas turbine compressor inlet. The frequency of on-line water wash of the gas turbine is a function of the gas turbine performance degradation due to GT compressor fouling. In general, on-line water wash has been found to be effective if carried out on a daily basis. Typically on-line water washing using water and detergent takes about 40 minutes to complete a cycle.
5. The emission limits for the turbines shall apply at all times, except during initial turbine commissioning, turbine start-up and shutdown conditions, and water wash of the combustion turbine. Start-up, shutdown and water wash exemptions shall apply for the period of time from the turbine's first fire to twelve months from the initial performance test. Within twelve months from the required initial performance testing, Westbrook Power shall propose to the Bureau of Air Quality numerical emission limits for NO_x, CO and opacity to apply during turbine start-up, shutdown and water wash conditions. Continuous emission monitoring and/or stack testing data gathered during start-ups and shutdowns shall be used to enable Westbrook Power to propose these limits.

D. Package boiler operation shall be limited to no more than the equivalent of 1000 hours per year (based on a 12 month rolling average) at maximum design load. The boiler shall be operated with natural gas only.

E. Diesel generator operation shall be limited to no more than 500 hours per year (based on a 12 month rolling average), on distillate oil with a sulfur content not to exceed 0.05% by weight. Diesel generator operation shall be limited to facility power outage periods and short periodic runs to ensure the engine's working condition.

F. Fire pump operation shall be limited to no more than 500 hours per year (based on a 12 month rolling average), on distillate oil with a sulfur content not to exceed 0.05% by weight. Fire pump operation shall be limited to facility fire fighting and short periodic runs to ensure the fire pump engine's working condition.

(19) Emission Limits

A. Emission limits from each combustion turbine shall not exceed the following limits, except during turbine start-up, shutdown, water wash and initial turbine commissioning of the turbines:

	PM/PM_{10}	**SO_2**	**NOx**	**CO**	**VOC**	**Ammonia**	
ppmdv (corrected to 15% O_2)	--	--	2.5	15	--	10	20
ppmdv averaging time	--	--	3-hr block	24-hr block		30 day rolling	24-hr block
lb/hr	22	12	18	53	3	--	--
Control Technology	nat gas	nat gas	DLN & SCR	good combustion control	good combustion control	--	

B. Emission limits from the ancillary equipment shall not exceed the following limits:

	Package Boiler		**Diesel Generator**		**Fire Pump**	
Pollutant	lb/MMBtu	lb/hour	lb/MMBtu	lb/hour	lb/MMBtu	lb/hour
PM/PM_{10}	0.12	0.25	0.12	0.54	0.12	0.21
SO_2	-	0.03	-	0.27	-	0.51
NOx	0.035	0.88	-	17.28	-	7.81
CO	-	3.75	-	4.59	-	1.68
VOC	-	0.50	-	0.43	-	0.06

C. Westbrook Power shall limit total annual facility emissions to the following, based on a 12 month rolling total:

Pollutant	Tons Per Year
PM/PM_{10}	205.4
SO_2	87.8
NO_x	157.4
CO	432.7
VOC	24.9
NH_3	188.3

(20) Visible Emissions

A. Visible emissions from each turbine shall not exceed 20% opacity on a six (6) minute block average basis, except for one (1) six (6) minute block average period per hour of not more than 27% opacity.

B. Visible emissions from the package boiler shall not exceed 20% opacity on a six (6) minute block average basis, except for one (1) six (6) minute block average period per hour of not more than 27% opacity.

C. Visible emissions from the diesel generator and the fire pump shall not exceed 30% opacity on a six (6) minute block average basis, for more than two (2) six (6) minute block averages in a 3-hour period.

(21) Monitoring Requirements

A. Westbrook Power shall install, calibrate, test, operate and maintain a Data Acquisition System(s) (DAS) and stack CEMS to measure and record flue gas emissions of NO_x, CO and a diluent (CO_2 or O_2).

B. Westbrook Power shall install, calibrate, test, operate and maintain a DAS and a stack CEMS to measure and record flue gas emissions of ammonia.

C. Westbrook Power shall ensure that all stack monitors and recording equipment conform with the EPA monitoring specifications in 40 CFR part 60.13 and 40 CFR Part 60 Appendices B and F, all applicable portions of 40 CFR Parts 72 and 75, 40 CFR Part 52.1020(c)(24) and Chapter 117 of Maine Air Regulations.

D. Westbrook Power shall continuously measure and report natural gas flow to the turbines on an hourly block average basis.

E. Westbrook Power shall monitor and record the sulfur and nitrogen content of the natural gas in accordance with 40 CFR 60.334. However, upon approval from EPA Region I, Westbrook Power shall adhere to the following fuel monitoring schedule:

There will be no fuel monitoring for nitrogen content if Westbrook Power combusts only pipeline quality natural gas.

Westbrook Power shall sample the natural gas for sulfur content at least every six (6) months, using either ASTM reference methods D 1072-80, D 3031-81, D 4084-82, or D 3246-81 Per Subpart GG (40 CFR 60.335(d)).

In all cases, Westbrook Power shall comply with 40 CFR 60.332 and 60.333.

F. The diesel generator and fire pump shall each be equipped and operated with an hour meter.

(22) Testing Requirements

A. Westbrook Power shall conduct initial performance testing on each gas turbine for nitrogen oxides, carbon monoxide, particulate matter and volatile organic compounds to demonstrate compliance with the lb/hr emission limits.

B. Westbrook Power shall conduct the initial performance tests within 60 days after achieving the maximum production rate at which the plant will be operated, but no later than 180 days after the initial start-up. All testing shall comply with the specifications of the Department compliance test protocol and with 40 CFR Part 60, as appropriate, or other methods approved by the Bureau of Air Quality and EPA.

C. Westbrook Power shall demonstrate compliance with the PM_{10} emission limits for the turbines via stack testing using EPA test method 201A.

D. Westbrook Power shall demonstrate compliance with the VOC emission limits for the turbines via stack testing using EPA test method 18.

E. Westbrook Power shall demonstrate compliance with NO_x, CO, and ammonia ppmdv emission limits for the turbines using the required CEMS.

F. Westbrook Power shall demonstrate compliance with the SO_2 lb/hr emission limit for the turbines by restricting fuel to pipeline quality natural gas and recording hourly fuel flow rate on a one (1) hour block average basis.

G. Westbrook Power shall demonstrate compliance with the visible emission limit for the turbines in accordance with EPA test method 9.

H. Westbrook Power shall re-evaluate the emission limits for ammonia thirty six (36) months after initial start-up.

I. Westbrook Power shall demonstrate compliance with package boiler, diesel generator and fire pump emission limits by fuel records and hour meter records, and, upon request by the Bureau of Air Quality or EPA, stack testing in accordance with 40 CFR Part 60, Appendix A.

(23) Recordkeeping Requirements

A. The CEMS required by this license shall be the primary means of demonstrating compliance with emission standards for the pollutants monitored as required by this Order, Maine Statute, or state or federal regulation, as applicable. For all CEMS, Westbrook Power shall maintain records of the most current six year period. These records shall include:

1. documentation that all CEMS are maintained and operated in accordance with DEP regulations Chapter 117, and 40 CFR part 52.1020(c)(24);
2. records of all measurements, performance evaluations, calibration checks, and maintenance or adjustments for each CEMS; and
3. upon written request by the Department, a report or other data indicative of compliance with the applicable emissions standard for those periods when the CEMS were not in operation or produced invalid data. Evidence indicating normal operations shall constitute such reports or other data indicative of compliance with applicable emission standards.

B. Westbrook Power shall maintain records of the most current six year period of all monitored fuel flow rates required as a condition of this license. These records shall consist of the following:

1. documentation which shows fuel flow rate status during all source operating time, including calibration and audits; and
2. a complete data set of all monitored fuel flow rates, as specified in this license. All records shall be made available to the Department upon request.

(24) Reporting, Notification, and Submittal Requirements

A. Westbrook Power shall notify the Bureau of Air Quality of the anticipated date of the initial start-up not more than 60 days nor less than 30 days prior to such date.

B. Westbrook Power shall notify the Bureau of Air Quality in writing of the date construction of the facility commenced no later than 30 days after such date.

C. Westbrook Power shall notify the Bureau of Air Quality in writing of the date of the actual initial start-up no later than fifteen (15) days after such date.

D. Westbrook Power shall submit quarterly reports to the Department within 30 days after the end of each calendar quarter, detailing operational performance of turbine control equipment, turbine parameter monitors, and turbine CEMS required by this license and outlined as follows:

1. downtimes and malfunctions for control equipment, parameter monitors, and CEMS;
2. all excess events of emission and operational limitations set by this Order, Maine Statute, state or federal regulations, as appropriate; and
3. a report certifying there were no excess emissions, if that is the case.
4. Report the following information for each excess event:
   a. the standard exceeded;
   b. date, time and duration of excess event;
   c. maximum and average values of the excess event, reported in the units of the applicable standard; and
   d. suspected cause of the excess event to include measures to be taken to help ensure that the event does not occur again.

E. Westbrook Power shall notify the Department in writing of the date on which the initial performance testing of the CEMS will begin, at least 30 days prior to such date.

F. Westbrook Power shall submit an application for an initial Part 70 Air Emission License under Chapter 140 of the regulations within 12 months after commencing operation.

G. Westbrook Power shall submit, for each required emission monitor, specifications, monitor location, calibrations and operating procedures,

and quality assurance procedures to the Department for review and approval at least 180 days prior to expected start-up.

(25) Other Requirements

A. Westbrook Power shall comply with the applicable federal acid rain program requirements codified in 40 CFR Part 72, 73, 75, 77 and 78.

B. Westbrook Power shall apply for a license pursuant to 40 CFR Part 72, as a Phase II Acid Rain facility 24 months prior to start-up or by January 1, 1999, whichever is later.

C. Westbrook Power shall obtain and hold in the EPA Allowance Management System, sufficient Acid Rain allowances for each ton of SO_2 emitted annually in accordance with the requirements of 40 CFR Part 72.

D. Prior to commencing operation, Westbrook Power shall demonstrate to the Maine DEP that NO_x emission offset credits have occurred in the amount necessary to comply with Chapter 113 requirements. The emission offsets must be surplus, quantifiable, federally enforceable and permanent.

E. Westbrook Power shall comply with federal new source performance standards (NSPS) 40 CFR Part 60 Subparts A and GG.

F. Westbrook Power shall comply with the federal accidental release program requirements (for aqueous ammonia) codified in 40 CFR Part 68, as applicable.

(26) The term of this order shall be for five (5) years from the signature date below.

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF 1998.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____

Westbrook Power LLC	**)**	**Departmental**
Cumberland County	**)**	**Findings of Fact and Order**
Westbrook, Maine	**)**	**Air Emission License**
A-743-71-A-N	**33**	

EDWARD O. SULLIVAN, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: August 7, 1998
Date of application acceptance: August 7, 1998

Date filed with Board of Environmental Protection:_____

This order prepared by Stephanie L. Carver , Bureau of Air Quality